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This report investigates the predictive ability of the Strong Vocational Interest Blank's Academic Achievement Scale in identifying patterns of interest associated with good scholarship. Thirty-six males were randomly selected. Scores on the Strong Vocational Interest Blank, the Washington Grade Prediction tests, high school ranks and performance on parts of the Wechsler Adult Intelligence Scale were analyzed to test two hypotheses related to academic achievement: (1) the mean of the actual GPA for subjects scoring in the upper half of the AACH scale does not differ from the mean of those scoring in the lower half; and (2) there is no significant interaction effect between AACH classification as an under- or overachiever and GPA. Results indicate that the Academic Achievement Scale is not an indicator of whether or not the student is motivated to achieve beyond what is expected of him, as determined by scholastic predictors. (JC)

THE STRONG VOCATIONAL INTEREST BLANK'S AACH SCALE AS A PREDICTOR OF ACADEMIC UNDER- AND OVERACHIEVEMENT

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Introduction

Inability to predict precisely college grade point averages from measures of scholastic ability and previous performance has suggested that other factors must also contribute to academic performance. One factor typically investigated can be called academic motivation which posits that a component of an individual's academic performance is, in part, due to the effort he applies toward scholastic activity as a result of his desire to learn. Interests are particularly thought to be indicative of academic motivation and several studies have been initiated to investigate the contribution of interests to academic achievement (Mosier, 1937; Williams, 1937; Young, 1936; Kendall, 1947; Ostrom, 1949; Gustad, 1952; Martin, 1964).

In 1966, E.K. Strong and David Campbell, with the aid of Ralph Berdie and Kenneth Clark, revised and updated the Strong Vocational Interest Blank. Included in this

[1]This study was initiated at the suggestion of Dr. Clinton Chase while the author was attending the 1967-68 NDEA Institute at Indiana University. At present he is a counselor at Skagit Valley College in Washington.

revision was a new scale, the Academic Achievement Scale (AACH) which purportedly identifies patterns of interests associated with good scholarship. It includes items which differentiated students of high and low academic achievement and is reported as being moderately effective in predicting grades and eventual educational level (SVIB Manual, 1966).

Interests have also been used in the prediction of under- and overachievement. Hummel and Springthall (1965) held mental ability and certain social status variables constant and divided a sample of bright adolescent males into underachievers, par achievers, and overachievers on the basis of GPA. They found that superior achievers scored significantly higher on the Social Service, Occupational Level, and Interest Maturity scales while underachievers scored higher on Business Contact scales. They concluded that superior achievers have interests similar to men in high-level professional and business careers while underachievers displayed interests similar to those of men in real estate, life insurance, and sales management--occupations thought to reflect a practical, utilitarian orientation to living. These results suggest that interests may contribute to the understanding of the factors contributing to departures from expected achievement. This study continues the

investigation of the relationship between interests and scholastic achievement and will be concerned with whether or not the SVIB-AACH scale is useful in the prediction of academic under- and overachievement. Specifically, it will address itself to the questions, "Does the AACH scale distinguish between academic under- and overachievement on the basis of AACH score levels?" and, "Is there an interaction effect between AACH scores and being classified as an under- or overachiever?"

Procedure

As a result of another project carried on at Skagit Valley College during the 1966-67 school year, it was possible to secure for thirty-six randomly selected males, scores on the SVIB, the Washington Grade Prediction Tests (WGPT), their high school rank (HSR), and the performance, verbal, and full-scale scores of the Wechsler Adult Intelligence Scale (WAIS). These data were subjected to a step-wise regression analysis and each student's cumulative GPA was predicted. Since these students had attended college for a minimum of two quarters it was possible to subtract their predicted GPA from their actual GPA thus providing 36 residuals which were positive if the actual GPA was above the predicted GPA and negative if the actual GPA fell below the predicted GPA. After the residuals had been determined their magnitude was examined and those which fell above or below the predicted GPA by one-half standard error

of measurement or more were arbitrarily dichotomized as "underachievers" and "overachievers." This dichotomization resulted in 7 students being classified as underachievers and 13 as overachievers while 16 fell within the prescribed error boundaries and hence were not included in any further analysis.

Once the dichotomization had been completed, the subjects were analyzed through a 2 X 2 factorial analysis of variance, fixed-model design using positions on the upper or lower half of the AACH scale as the treatment factors, the classification into over- and underachievers as the levels factor and actual GPA as the dependent variable.

The two hypotheses to be tested were:

ho_1: The mean of the actual GPA for subjects scoring in the upper one-half of the AACH scale does not differ from the mean of those scoring in the lower half of the AACH scale.

ho_2: There is no significant interaction effect between AACH classification as an under- or overachiever and GPA.

Results

To categorize the subjects as under- or overachievers, eight prediction variables and one criterion variable (GPA) were included in a step-wise regression analysis prepared by the Health Sciences Computing Facility, UCLA (BMD02R).

Table 1 summarizes the Means and Standard Deviations for the nine variables.

Insert Table 1 here

Table 2 indicates the multiple correlation coefficients of the predictors in order of their contribution to the criterion variance and the increase in R^2 with the addition of each new variable to the regression equation. It should be noted that all variables were retained in the solution of the regression equation.

Insert Table 2 here

TABLE 1

Means and Standard Deviations of Predictors and Criterion

Variable	Mean	Standard Deviation
WAIS – Verbals	115.42	7.87
WAIS – Performance	110.50	8.40
WAIS – Full Scale	114.19	7.74
HSR[a]	.53	.23
WGPT[b] – Verbal Composite	46.31	7.76
WGPT[b] – Quantitative Composite	51.42	9.39
WGPT[b] – Spatial Score	48.75	10.84
WGPT[b] – Mechanical Reasoning	53.78	8.95
Accumulative Grade Point Average	2.12	.63

[a]Expressed as a ratio between rank from bottom of class and total number in class.

[b]Expressed as T scores.

TABLE 2

Variable Multiple Correlations and Contributions to Criterion Variance

Step	Variable Entered	Variable Removed	R	R^2	Increase in R^2
1	HSR	---	.616	.380	.380
	WGPT				
2	Quantitative Composite	---	.680	.463	.083
3	Verbal Composite	---	.695	.482	.020
4	Mechanical Reasoning	---	.708	.502	.019
	WAIS				
5	Verbal	---	.717	.514	.012
	WGPT				
6	Spatial	---	.719	.516	.002
	WAIS				
7	Performance	---	.719	.517	.001
8	Full Scale	---	.719	.518	.000

The final regression equation is as follows:

$$\hat{Y} = -1.828 + .0307(X_1) + .0170(X_2) + (-.0305)(X_3) + .9062(X_4) + .0131(X_5) + .0087(X_6) + (-.0044)(X_7) + .0127(X_8)$$

The Standard Error of Measurement for this equation is .4995, however, and earlier SE in the regression procedure of .4738 was actually used to place subjects in the over- and underachievement category as it best fitted the expected number of subjects into the three designated achievement categories (under-, par, and overachievers).

Once these classifications had been made the subjects were further classified according to whether they fell in the upper or lower half of the distribution of AACH scores and the resultant 2 X 2 table subjected to analysis of variance techniques.

Insert Table 3 here

Hartley's test for homogeneity of variance indicated the variances were not significantly different, $F_{MAX}(2,8)$ 2.17, $p < .05$. Differences in academic achievement as measured by GPA were not found to be statistically significant when subjects were classified by their AACH scale scores, $F\ (1, 16) = < 1.0$, ns. However, the levels classification as an under- or overachiever, was found to reli-

TABLE 3

Analysis of Variance

Source	df	SS	MS	F
AACH Scale (AA)	1	.1946	.1946	1.0
Degree of Achievement (Ach)	1	4.8663	4.8663	16.52**
Interaction (AA X Ach)	1	.5550	.5550	1.88
Error	16	4.7120	.2945	

**Significant at the .01 level.

ably differentiate students, $F(1, 16) = 16.52$, $p. < .01$. No interaction between the AACH scale and over/under-achievement was observed. Thus, the null hypotheses are accepted.

Discussion

According to Helmstadter (1964) one source of evidence which can be used to validate a test is to determine whether or not the test is able to classify individuals on the basis of a psychological construct (e.g., academic motivation). Strong and Campbell (1966) suggest the AACH scale of SVIB does provide an indication of the level of educational achievement a student may obtain and therefore possesses construct validity. Their results show the average scores on the AACH scale range from 29 for those with less than a college education to 62 for those completing a Doctor of Philosophy degree. Such results suggest that if the AACH scale is able to classify individuals according to level of educational attainment, it may also be related to over- and underachievement. Results of this study, however, do not support such a hypothesis but instead support the position that the AACH scale is not an indicator of whether or not one is motivated to achieve beyond what he is expected to as determined by scholastic predictors. Since no relationship was found between AACH scores and classification as an under/overachiever, it

appears the AACH is of little or no use in contributing to an explanation of the efficacy of academic achievement.

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